



Department of Energy  
Washington, D.C. 20545  
Docket No. 50-537  
HQ:S:83:263

DESIGNATED ORIGINAL

Certified By

*[Signature]*  
9/22/83

SEP 07 1983

Dr. J. Nelson Grace, Director  
CRBR Program Office  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Dear Dr. Grace:

CLINCH RIVER BREEDER REACTOR PLANT PROJECT (CRBRP) FAULT EVALUATION REPORT

The purpose of this letter is to provide the Nuclear Regulatory Commission (NRC) with formal notification of faults discovered on the CRBRP site during foundation excavation. Initial notification was provided by telecon to NRC Geosciences Branch and Region II staff for faults 1, 2, and 3 on May 13, 1983, May 25, 1983, and June 24, 1983, respectively. A preliminary description of the characteristics of each fault was presented during the telecons. Enclosed are the more formal fault evaluation reports for faults 1, 2, and 3.

On June 21, 1983, R. McMullen, NRC Geosciences Branch, examined the faulted areas and agreed that the geological conditions uncovered at the site were representative of those presented in the CRBRP Preliminary Safety Analysis Report.

We do not consider these faults to be capable within the meaning of Appendix A to 10 CFR Part 100.

Should you need any additional information, please contact Mr. Alvin Meller of the CRBRP Project Office staff.

Sincerely,

8309230400 830907  
PDR ADOCK 05000537  
A PDR

*[Signature]*  
Gordon L. Chipman, Jr.  
Acting Director, Office of  
Breeder Demonstration Projects  
Office of Nuclear Energy

4 Enclosures

cc:  
Service List  
Standard Distribution  
Licensing Distribution  
A. Ignatonis, NRC Region II

0001  
1/37

ENCLOSURE 1

FAULT EVALUATION REPORT

FAULT NO. 1

Excavation in the Nuclear Island area has exposed a fault on the West side of the excavation located approximately between Elevations 780 and 815 feet, within the range of plant coordinates N48+00 to N53+00 and E195+75 to E196+30. This fault is identified as Fault No. 1 on the attached Key Plan (Figure 1).

The fault is located in residual soil of the Unit A Upper Siltstone formation within the Chickamauga Group and comprises a series of localized bedding distortions and minor offsets of the type described in PSAR Section 2.5.1.1.3.1. Characterization and limits of the traces of the fault were studied by trenching in the area. Observations and measurements of the fault show movement along planes striking NE and steeply dipping to the SE. Several associated fault planes were observed to terminate by gradual transition into bedding planes or joints, and extended vertically from 1.8 feet to over 10 feet, and were traced laterally for a maximum distance of approximately 150 feet. Characteristics of the fault between stations N48+50 and N50+50 are shown on the Fault Detail Map (Figure 2). Photographs of the fault are presented in Appendix A.

The fault does not project to the Quaternary terrace deposits and is considered to be limited in lateral extent.

This fault is considered to represent an ancient adjustment which occurred at least 230 million years before present. The fault, having been stable for approximately 230 million years, is not considered to be capable of producing ground offsets or generating earthquakes. Therefore, we do not classify it as a capable fault, within the meaning of Appendix A to 10 CFR Part 100.





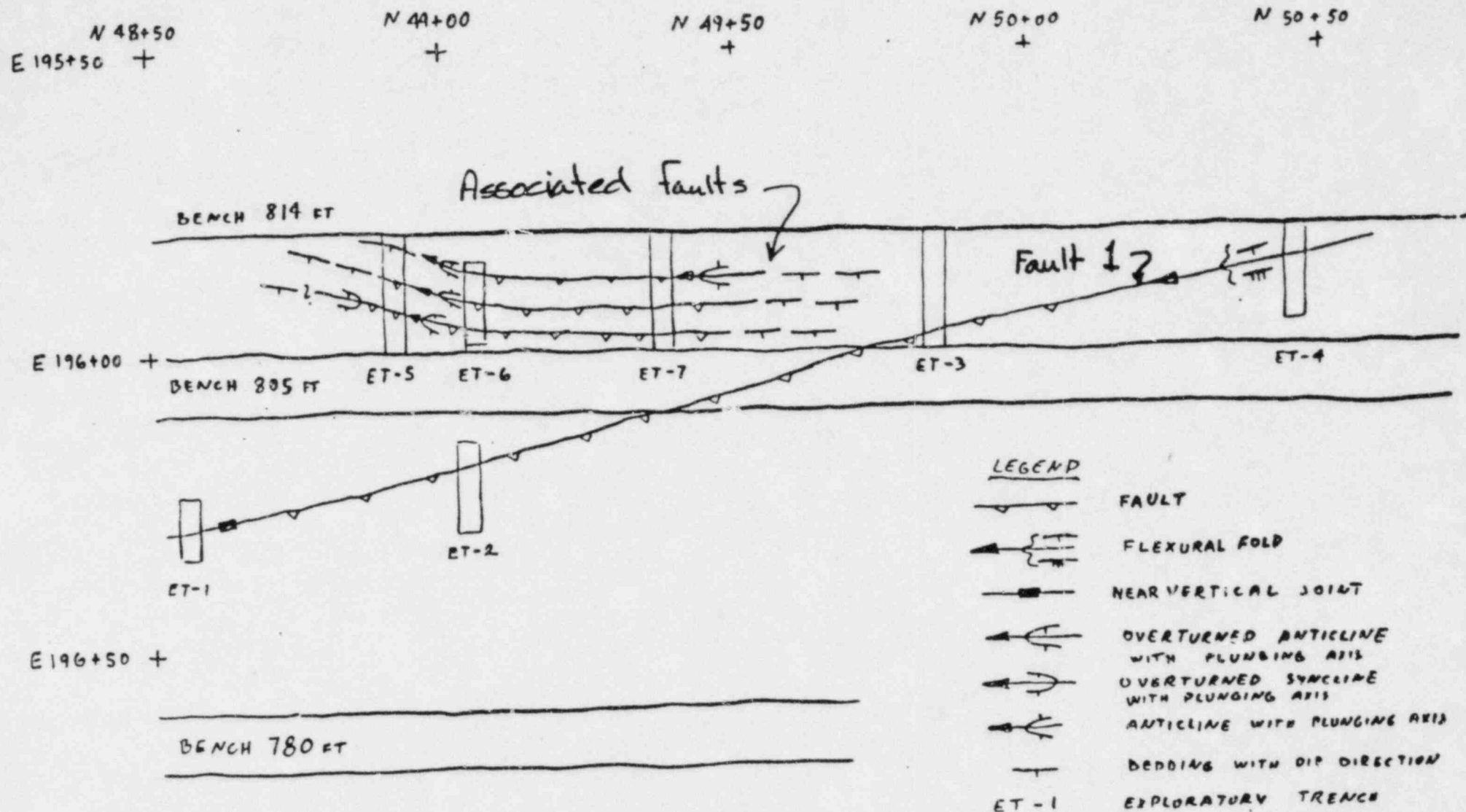


FIGURE 2  
 FAULT DETAIL MAP  
 (PLAN)

## APPENDIX A

### PHOTOGRAPHS OF FAULT NO. 1

#### PHOTO No. 1

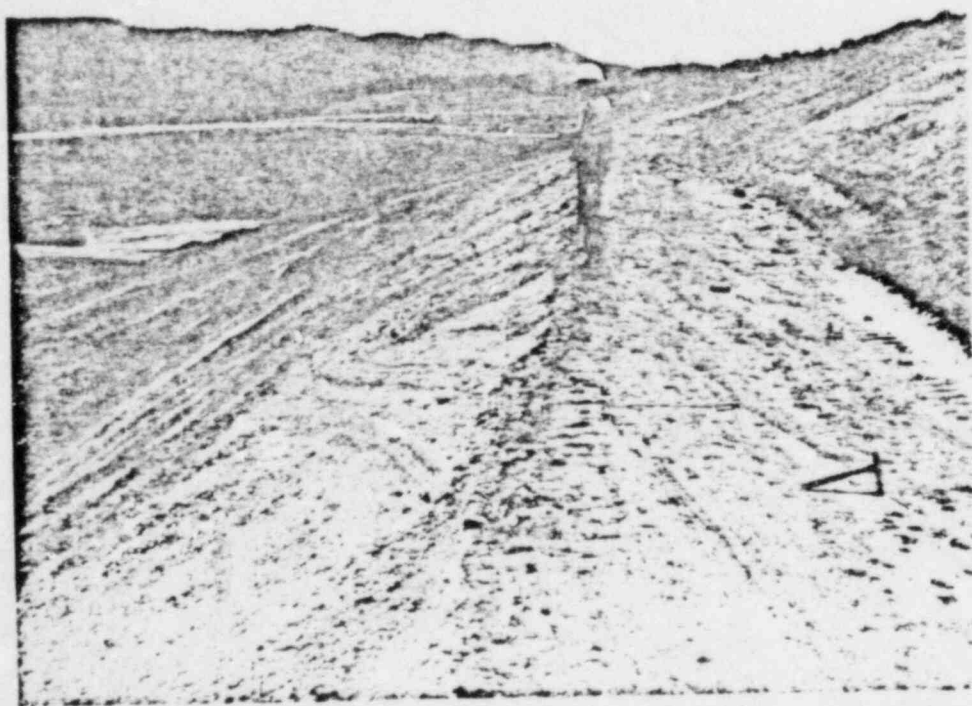
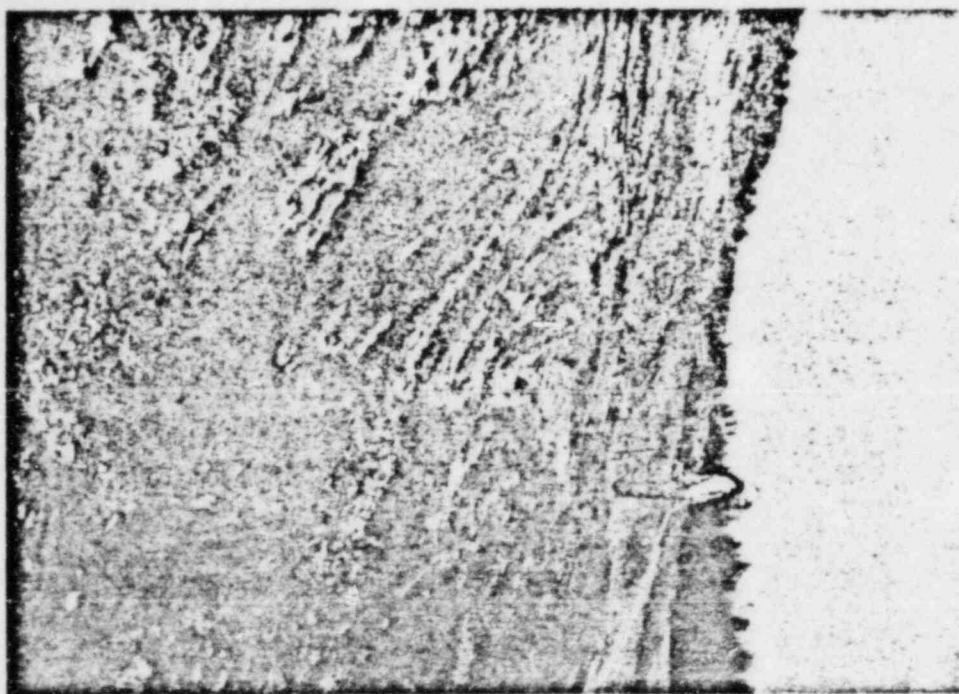
Surface exposure on the East slope of the West ridge, view NNW along strike between N48+00 and N53+00, and E195+75 and E196+30 and Elevations 780 to 815.

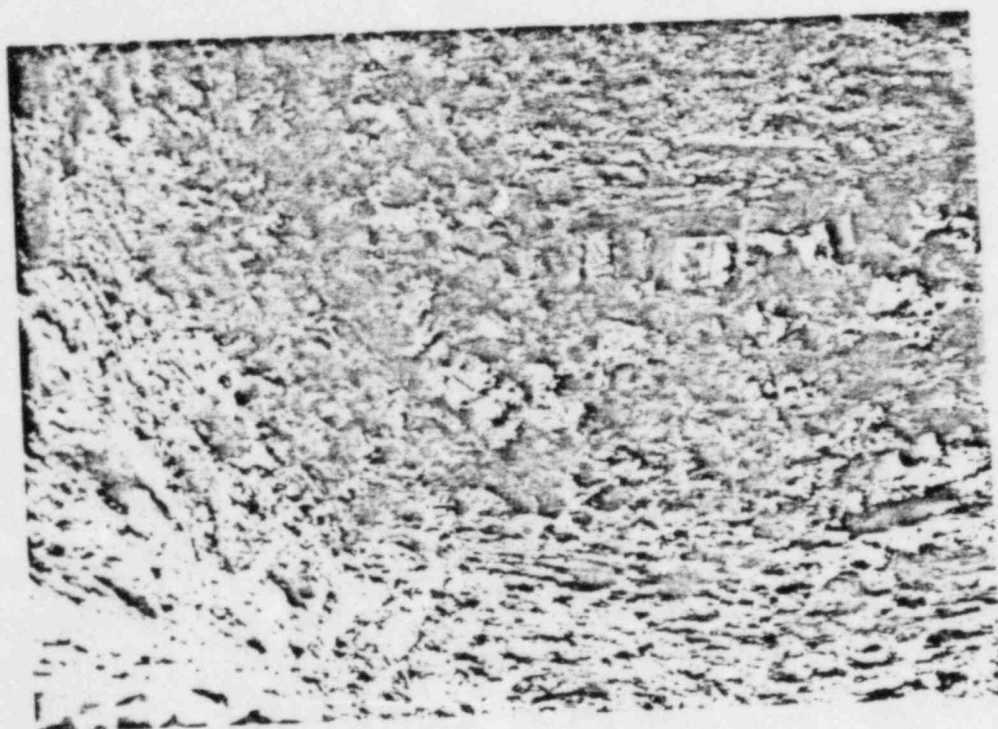
#### PHOTO No. 2

Surface exposure on the East slope of the West ridge, view SSE along strike.

#### PHOTO No. 3

Exploratory trench #4, North wall, close-up view of fold axis, slight off-set of chert bed.





## FAULT EVALUATION REPORT

## FAULT NO. 2

Excavation in the Nuclear Island area has exposed a transverse fault on the East side of the excavation located approximately at plant coordinates N50+35, E201+60, at Elevation 783. This is identified as Fault No. 2 on the attached Key Plan (Figure 1).

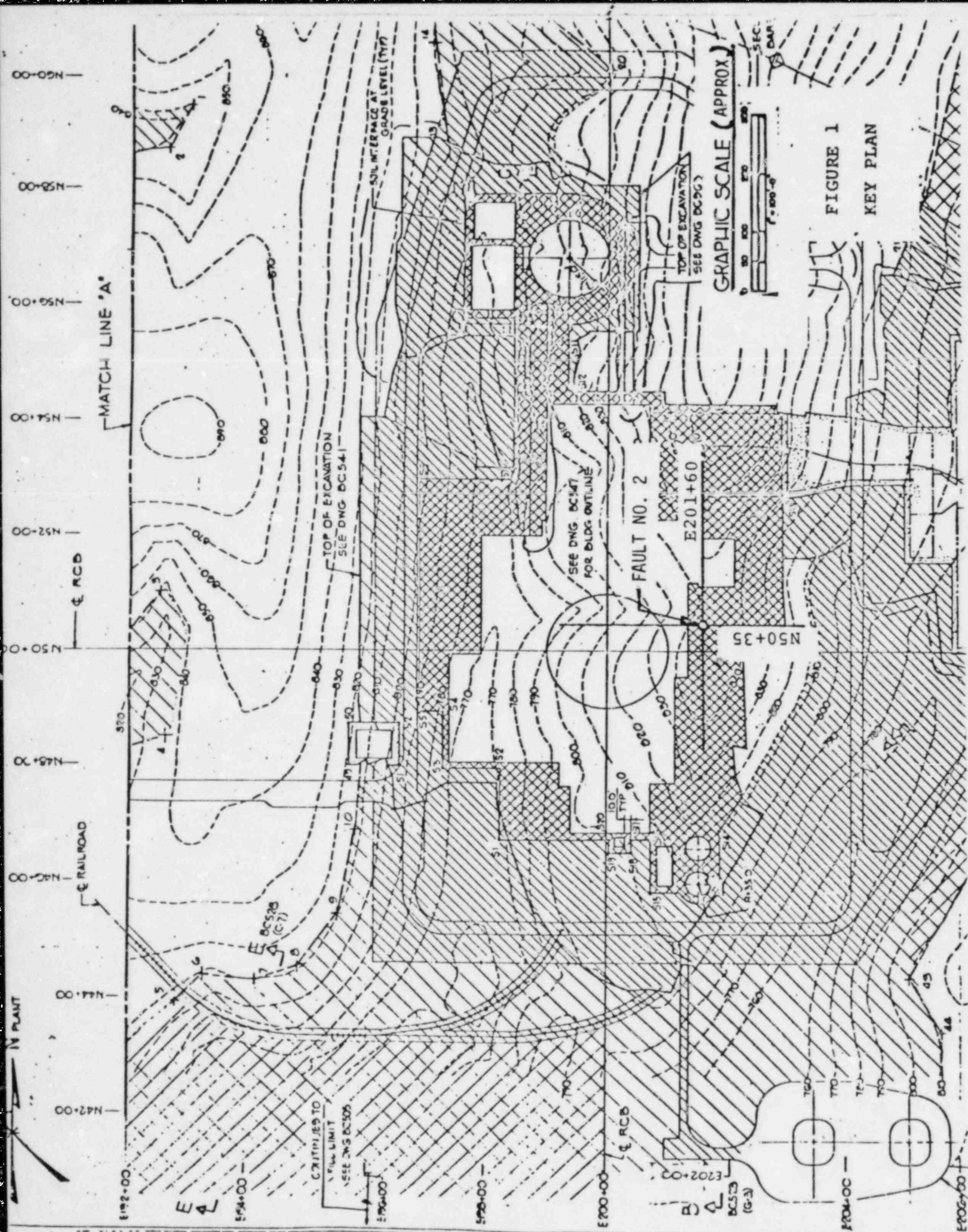
The main fault trace is located in the Unit B limestone, strikes N12°W to N47°W and dips 32° to 70° NE. The trace is defined by a partially weathered - calcite healed fracture with slickensides which indicate motion toward the NNW, and is limited to an approximately 15 foot thick stratigraphic sequence. The updip terminus of the main fault is located within an individual bed and the downdip terminus is located at a bedding plane containing slickensides. Left lateral displacement is measured at 0.4 foot, maximum.

The main fault, and an associated fracture which produced minor displacement, are approximately three feet apart and are shown on the attached Fault Map (Figure 2). A second associated fracture with minor displacement is approximately 25 feet to the North and is almost identical to the two features identified above. Photographs of the fault are presented in Appendix A.

The fault does not project to the Quaternary terrace deposits and is considered to be limited in lateral extent.

The fault and associated fractures are related to minor adjustments to bedding plane slippage due to the regional compressive forces existent during the Appalachian orogeny. This type fault has been described in the CRBRP PSAR, Section 2.5.1.2.4.3, and is considered to represent an ancient adjustment which occurred at least 230 million years before present. The fault, having been stable for approximately 230 million years, is not considered to be capable of producing ground offsets or generating earthquakes. Therefore, we do not classify it as a capable fault, within the meaning of Appendix A to 10 CFR Part 100.





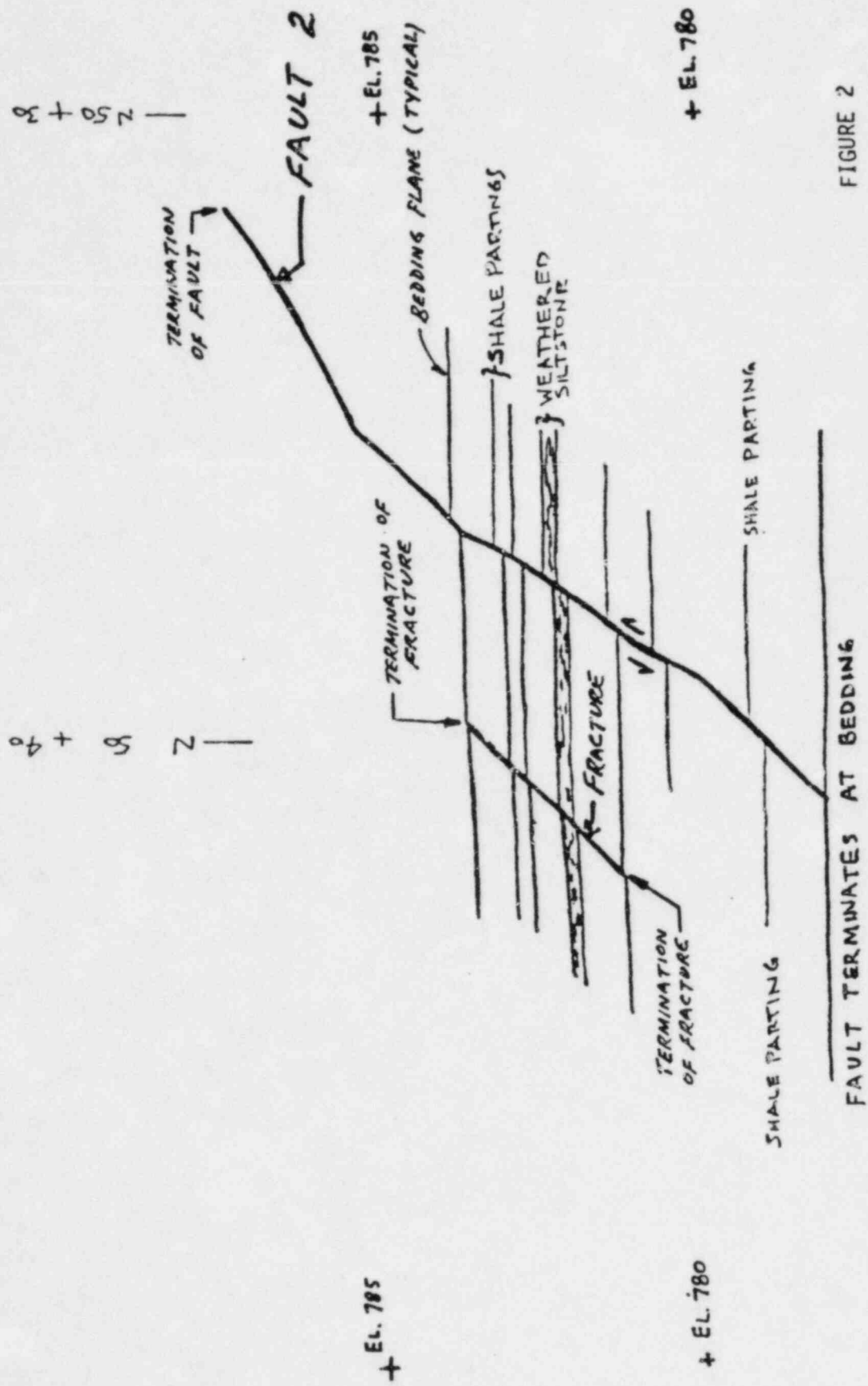


FIGURE 2

FAULT MAP  
(VERTICAL PLANE PROJECTION)

APPENDIX A

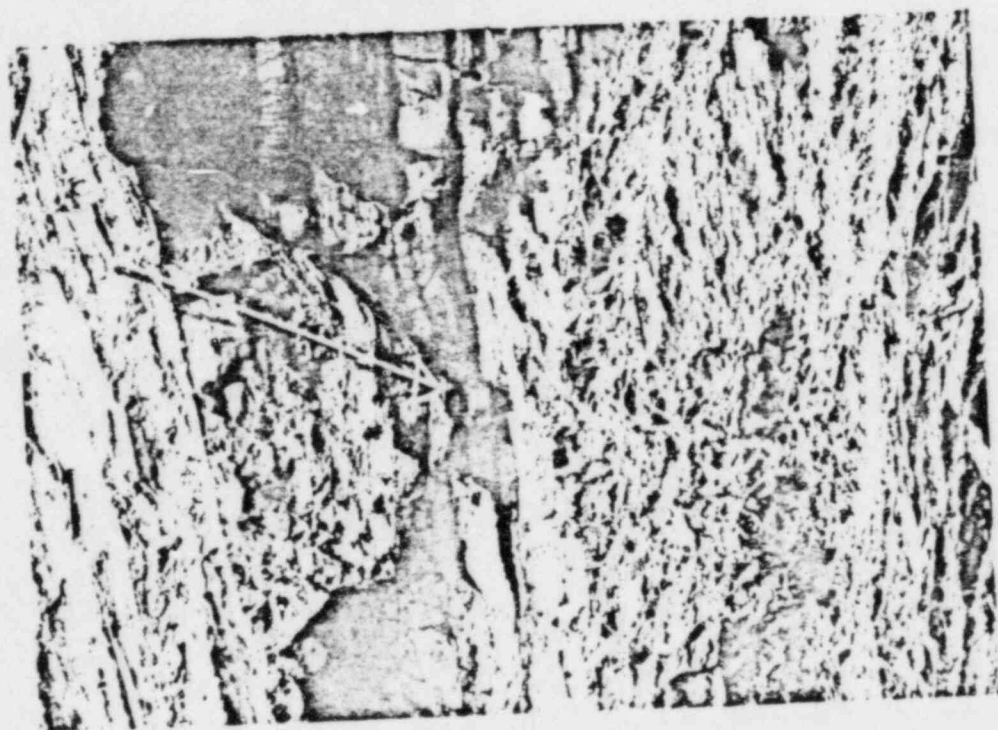
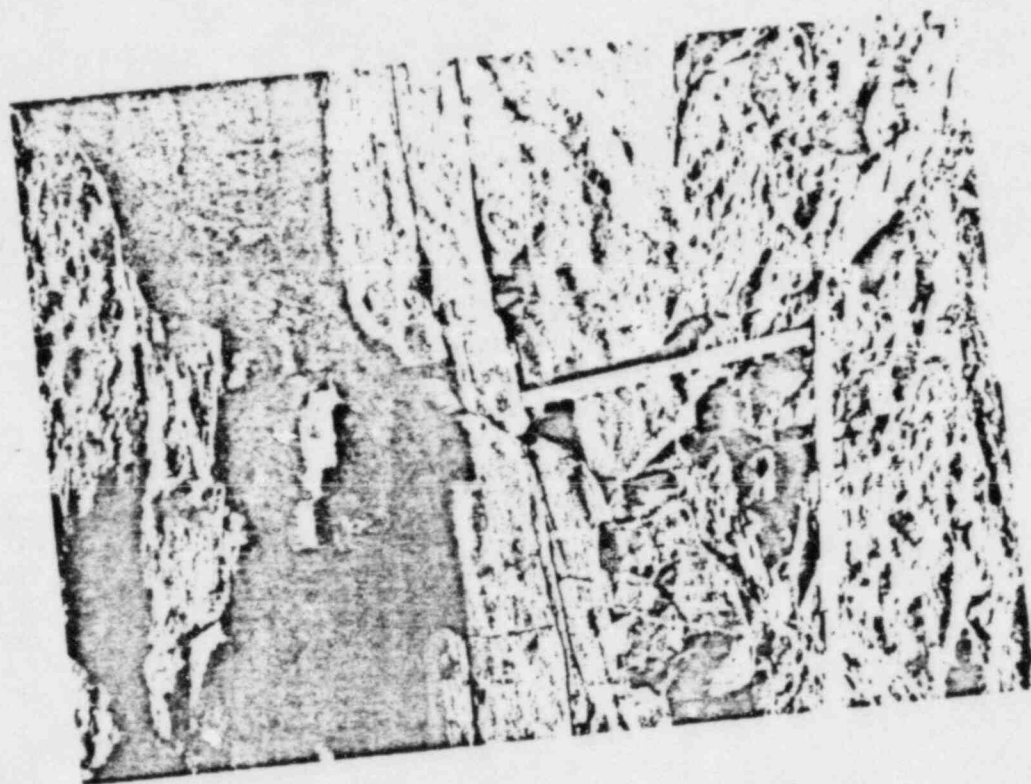
PHOTOGRAPHS OF FAULT NO. 2

PHOTO NO. 1

N50+36, E201+65 at upper terminating point, to the bench at  
Elevation 780 (bottom of picture).

PHOTO NO. 2

Close-up view of apparent off-set (0.2 ft.)





## ENCLOSURE III

### FAULT EVALUATION REPORT

#### FAULT NO. 3

Excavation in the Nuclear Island area has exposed a fault on the East side of the excavation located approximately within the plant coordinate range N47+55 to N47+75 and E201+20 to E201+40, at Elevation 780 feet. This fault is identified as Fault NO. 3 on the attached Key Plan (Figure 1).

The main fault trace is located in the Unit B limestone, and exhibits left lateral displacement to the West-Northwest of approximately 0.5 feet, as indicated by the combination of slickensides and the interrelation of corresponding beds on each side of the fault plane. Two other associated fractures were identified in close proximity to the main fault trace, but lacked any offset. All three features are less than 20 feet in length and terminate within rock exposure on the excavation slope.

Locations of the main fault trace and associated fractures are shown on the attached Fault Map (Figure 2). Photographs of the fault are presented in Appendix A.

The fault does not project to the Quaternary terrace deposits and is considered to be limited in lateral extent.

The fault and associated fractures are related to minor adjustments to bedding plane slippage due to the regional compressive forces existent during the Appalachian orogeny. This type fault has been described in the CRBRP PSAR, Section 2.5.1.2.4.3, and is considered to represent an ancient adjustment which occurred at least 230 million years before present. The fault, having been stable for approximately 230 million years, is not considered to be capable of producing ground offsets or generating earthquakes. Therefore, we do not classify it as a capable fault, within the meaning of Appendix A to 10 CFR Part 100.

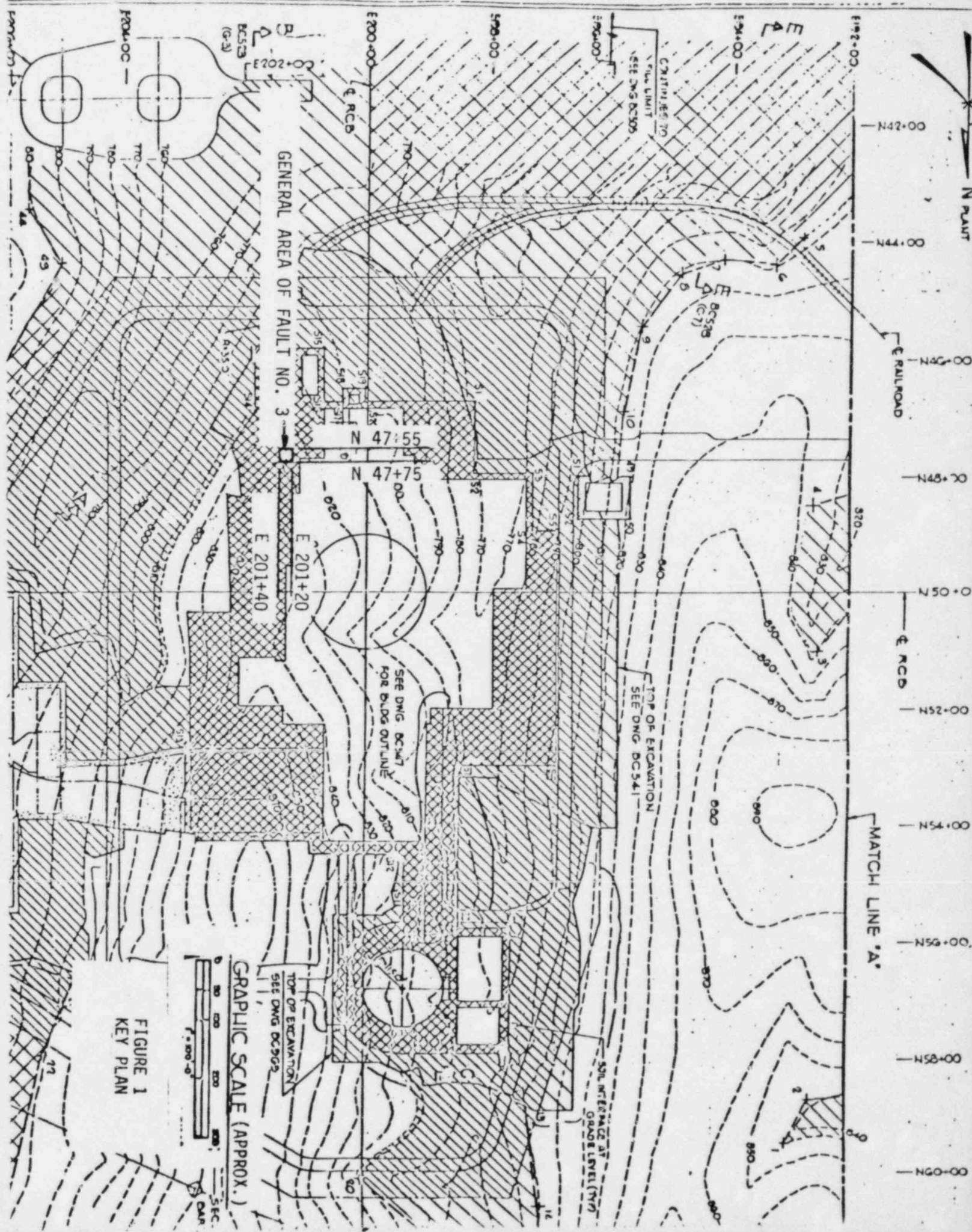


FIGURE 1  
KEY PLAN

GRAPHIC SCALE (APPROX.)

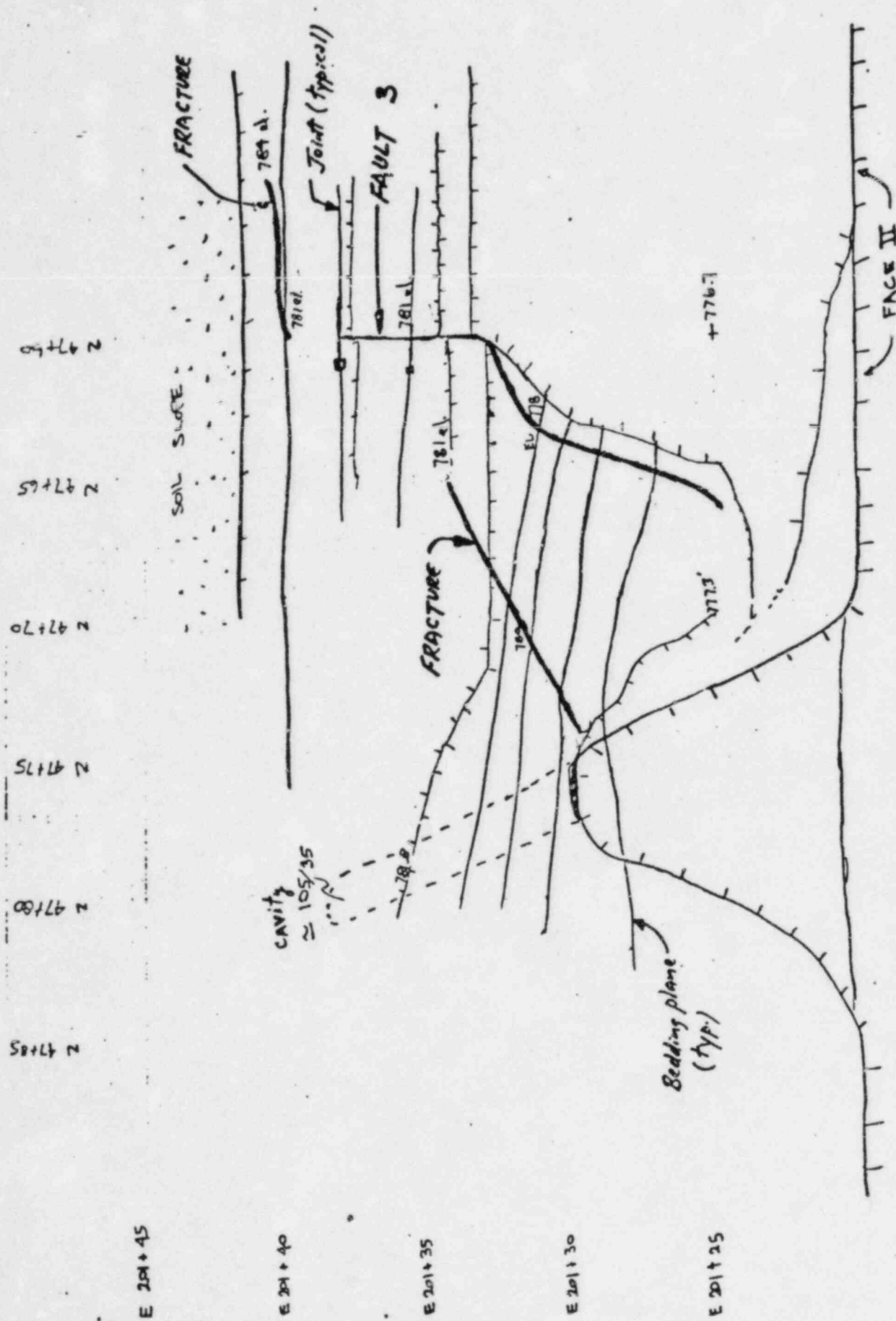


FIGURE 2  
FAULT MAP  
(PLAN)

APPENDIX A  
PHOTOGRAPHS OF FAULT NO. 3

PHOTO NO. 1

N47+60, Elevation 780, at approximately E201+35

PHOTO NO. 2

Fracture associated with the fault, below El. 780, North of N47+70



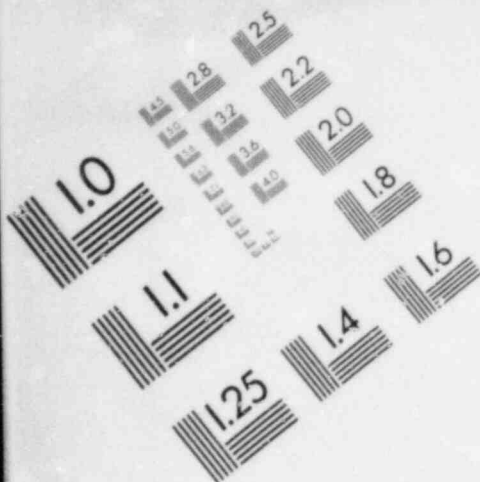
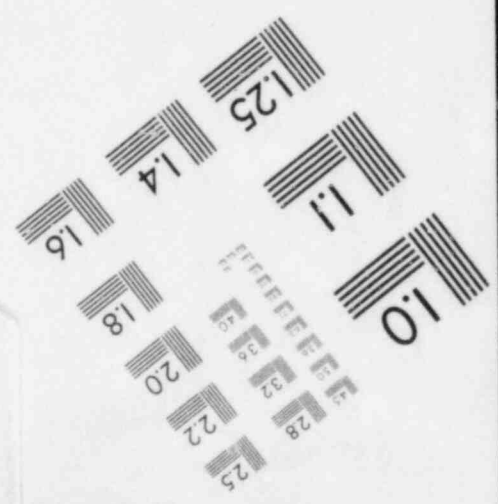
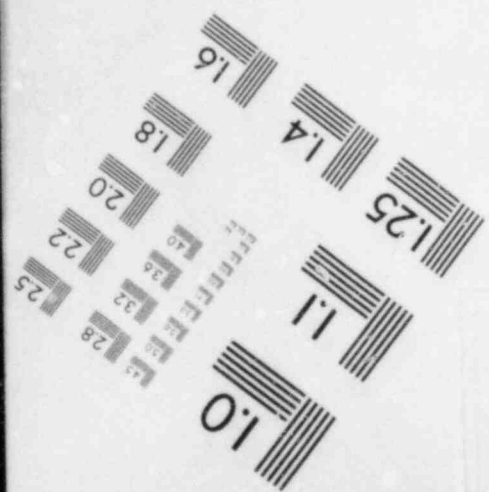
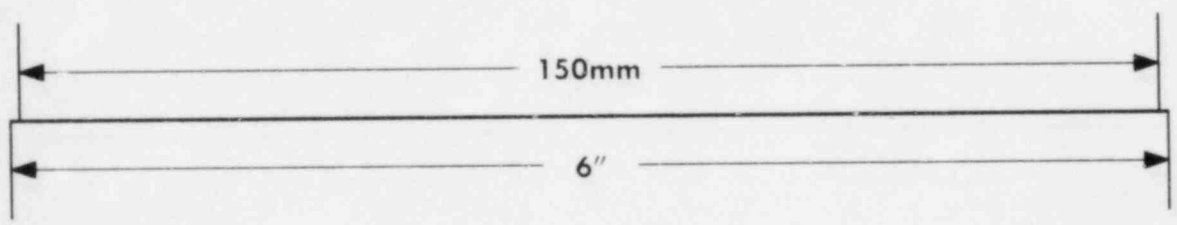
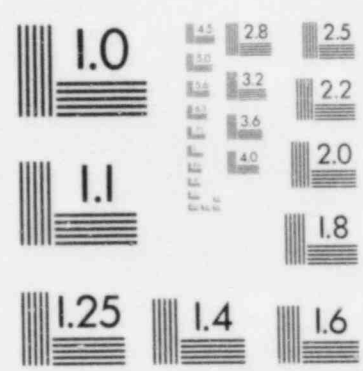
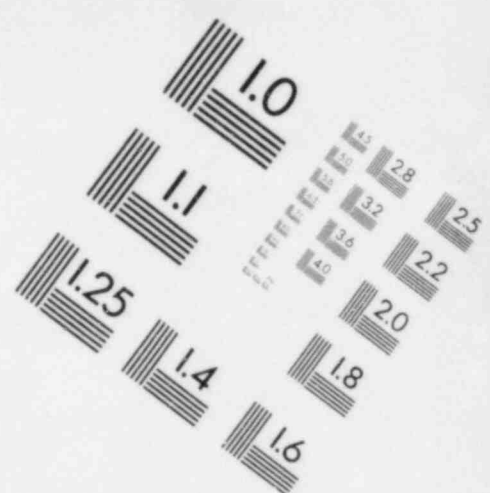


IMAGE EVALUATION  
TEST TARGET (MT-3)



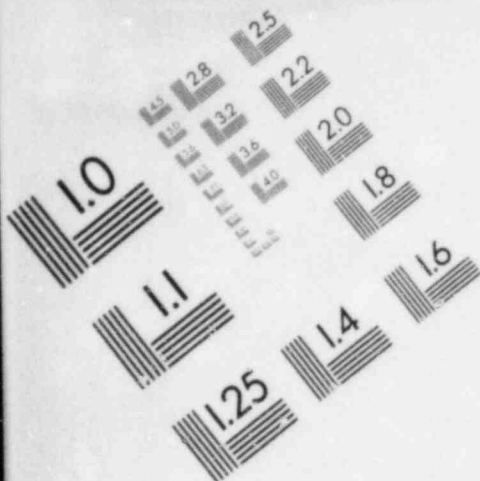
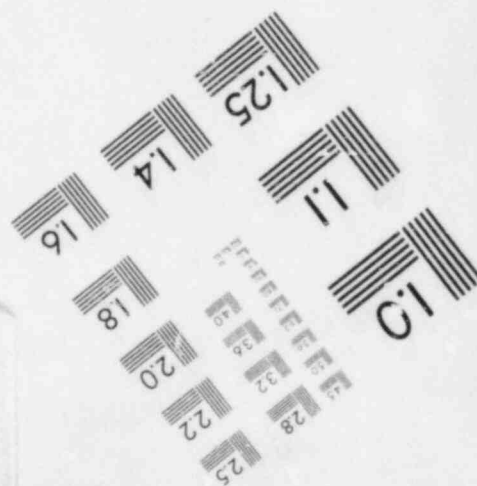
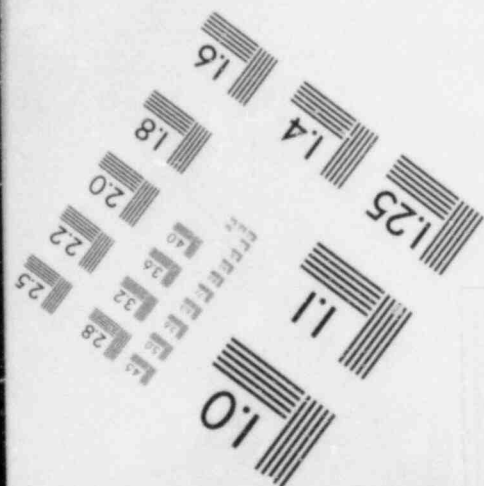
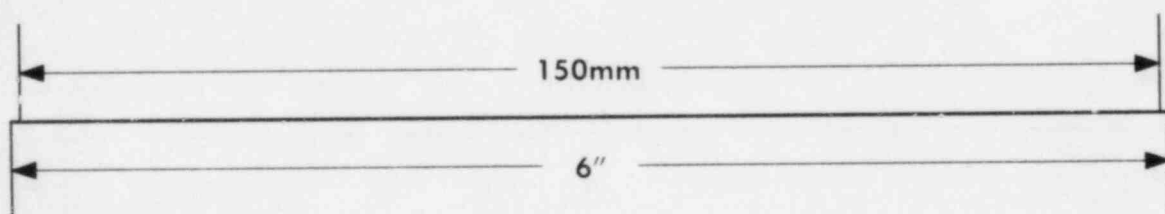
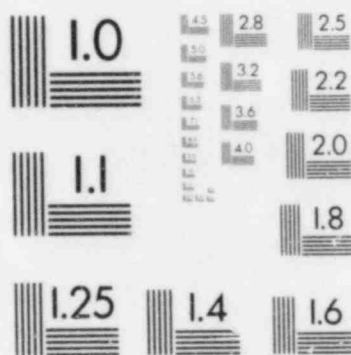
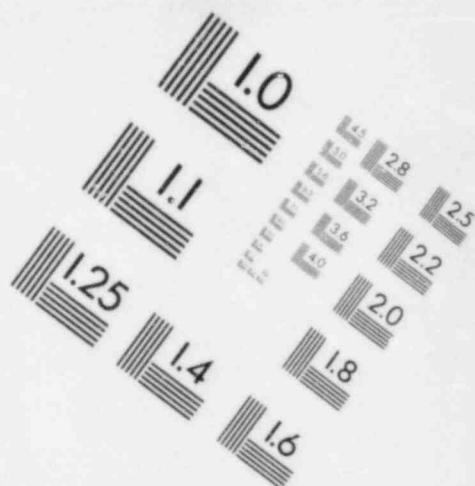
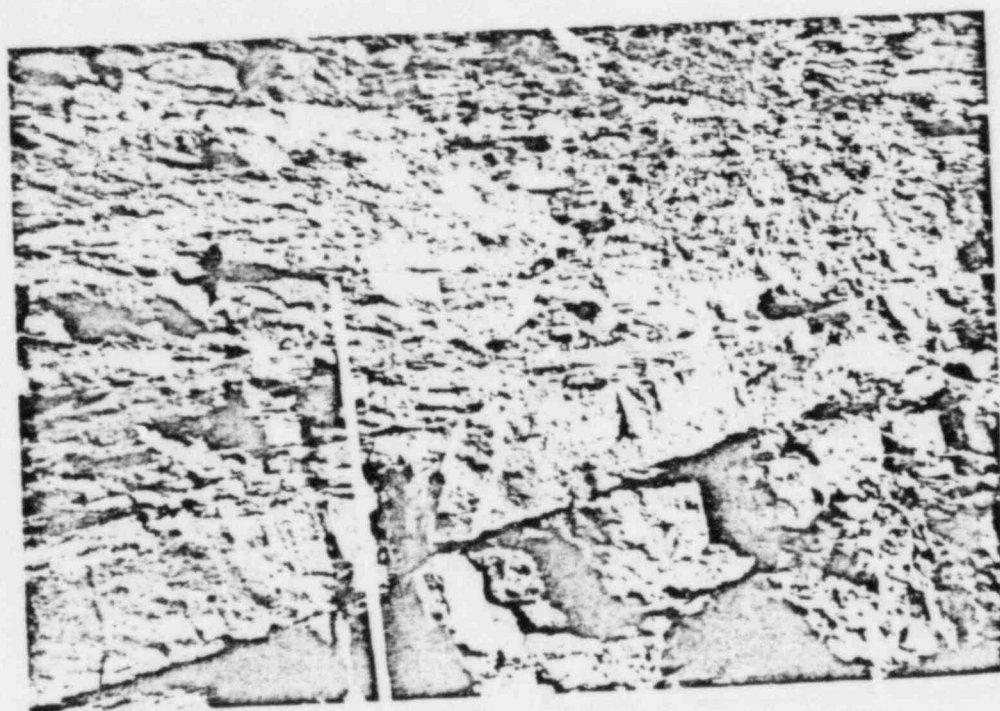
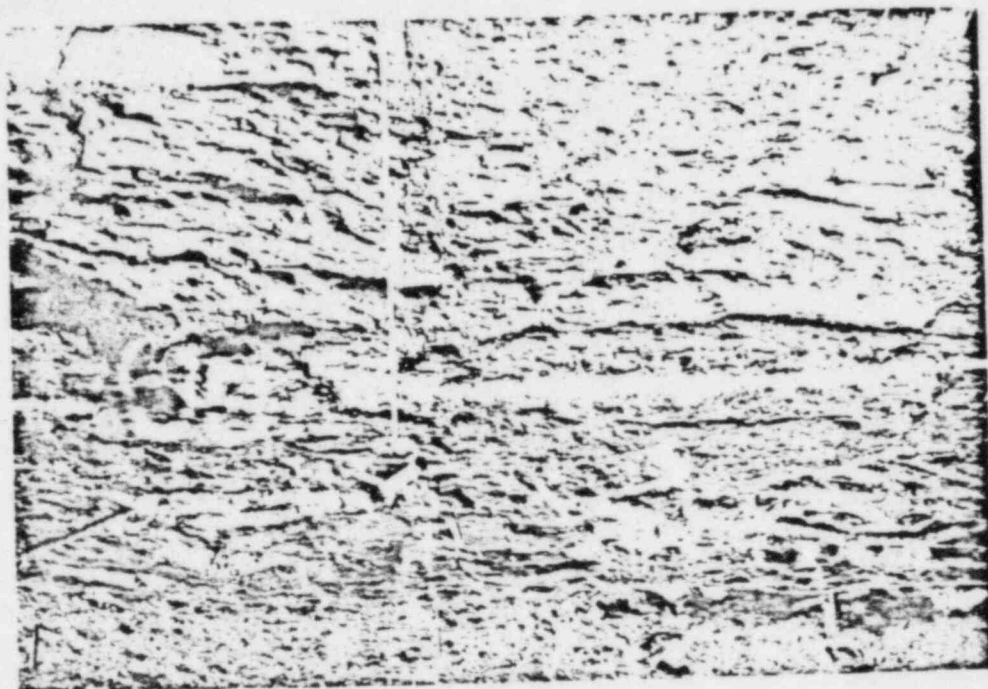
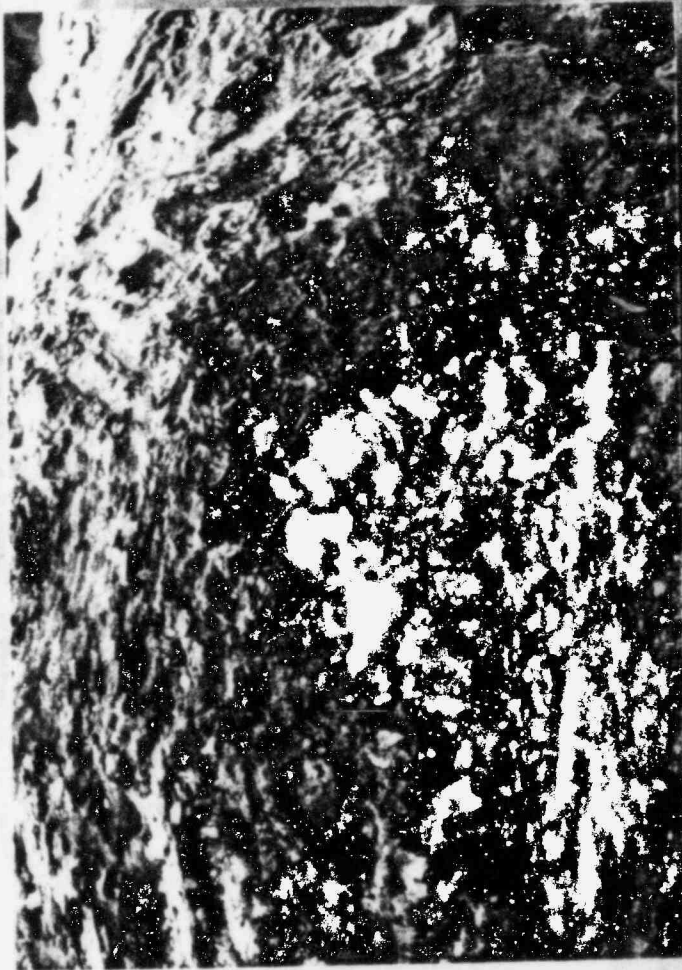


IMAGE EVALUATION  
TEST TARGET (MT-3)













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